

REMARKS

Claims 1-4, 13, 14, 16-19, and 21-23 have been rejected under 35 USC § 103 as being unpatentable over U.S. Patent 6,016,804 to Gleason et al. in view of U.S. Patent 6,701,925 to Resnick. Applicants respectfully submit that this rejection cannot be sustained.

Many respirators that are sold today use a thin rigid structural part to attach filter elements and valves to the respirator mask body. These rigid structural parts are commonly produced through an injection molding process and are often referred to as a "nosepiece" or "rigid insert". A soft compliant material, which is capable of conforming to a person's face, is disposed on or about the rigid structural insert to enable the mask to fit snugly over the wearer's nose and mouth. The use of a rigid insert in conjunction with a soft compliant portion tends to make the mask lighter and more comfortable to wear, particularly when compared to previous masks that had used thick rubber throughout essentially the whole mask body to support the filter cartridges and valves. U.S. Patent 6,016,804 to Gleason et al. shows an example of a rigid insert that would be used in conjunction with a compliant face-contacting member to form a face mask:

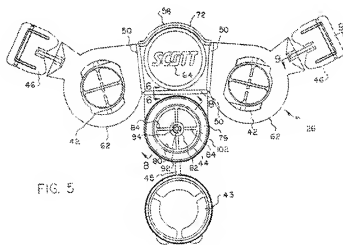


FIG. 5

GLEASON ET AL.

In the above figure, the rigid insert is generally identified using numeral 26.

The rigid structural components that are employed in mask facepieces regularly incorporate multiple integrated elements that have distinct dimensional tolerance requirements

and complex shapes that are customarily formed in molds at relatively great expense. Higher tolerance parts, more-often-than-not, require additional oversight and technical expertise to correctly manufacture. Therefore, for a given material and a given part design, the factor that limits production typically is related to the element that has the greatest tolerance requirement.

To properly utilize the efficiency and accuracy of injection-molding technology, designers have sought to encompass as much detail as possible in the molded part so that the whole rigid structural insert can be manufactured in one step. The Gleason insert 26 is a fine example of such a detailed part. The result of such complexity is that the tooling used is difficult to maintain and operate, especially when used in remote facilities that do not have access to well-trained technical resources. Thus, the higher tolerance requirements for certain portions of the rigid inserts can limit both the design and the production of the whole insert when made using conventional, single-stage, injection-molded technologies. Additionally, when a change to feature in the facepiece insert is needed, such as a different filter mount, a whole new mold must be provided to make the change. That is, a separate mold must be furnished for the whole insert and not simply for a portion of it.

Applicants' invention provides a new method of making a facepiece insert, which method comprises: (a) providing a supporting portion of a facepiece insert; (b) providing a fluid communication component separately from the supporting portion; and (c) securing the fluid communication component to the supporting portion to form the facepiece insert.

Applicants' invention also provides a new method of making a respiratory mask body by securing a compliant face-contacting member to the facepiece insert so produced.

The present invention further provides a new facepiece insert that comprises:

- (a) a supporting portion of a facepiece insert; and
- (b) a fluid communication component that is non-integrally joined to the supporting portion.

In applicants' invention, the fluid communication components — which commonly are critical tolerance components because they include more complicated and intricate filter attachment mounts and valve seats — are provided in a first step, and, in another step, a supporting portion of a facepiece insert is joined to the fluid communication component.

Applicants' FIG. 3 shows the inventive face piece insert 16, which comprises a supporting portion 34 and a fluid communication components 30, 32:

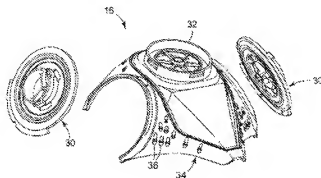


FIG. 3

As shown, the fluid communication components 30, 32 are non-integrally joined to the supporting portion 34.

The facepiece insert and its fluid communication components may be made using, for example, injection molding procedures that are carried out as separate operations. The multi-stage operation may address the tolerance mismatch between the insert components. Because the supporting part(s) and the fluid communication part(s) of the insert are separately provided, the inventive method can also support a beneficial distributed manufacturing scheme where fluid communication components can be produced in one location, with the associated expertise and equipment, and the final insert assembly can be carried out in a second location, where the expertise and associated equipment are lacking. And if a change to the fluid communication component is needed, for example, to allow for a different type of filter attachment, the whole facepiece insert does not need to be reconfigured in the mold. A separate mold need only be provided for the fluid communication component of the facepiece insert.

As indicated above, the primary reference to Gleason describes a facepiece insert that is suitable for use with a respiratory mask. As shown in FIG. 4, Gleason's facepiece insert 26 is a single solid part:

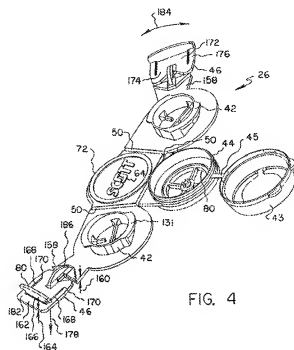
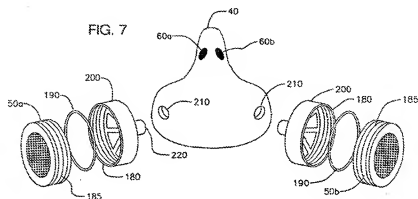


FIG. 4

The fluid communication components 42 and 44 are integrally joined to the supporting portion of the insert 26. Gleason thus, clearly does not recognize the method or respiratory mask of applicants' invention and in fact teaches away from it.

Resnick discloses a protective hood respirator. In rejecting the present claims, the Examiner relied on to Figure 7 of the Resnick disclosure. In that figure, a respirator cup 40 is illustrated that includes first and second filters 50a and 50b. These filters are mounted to the cup 40 through a filter interface 200 that has an attachment point 220. The attachment point 220 is inserted into a receiving point 210. These filters 50a-b have filter threads 185 that interface with interface threads 180. A gasket 190 is sandwiched between filters 50a-b and filter interface 200. The cup 40 is located in the interior of a hood 20 that is shown in Figures 1-3 and 5-6 and 9-12. The construction of the Figure 7 cup assembly is reproduced below for ease of reference:



As shown in Figure 7, the Resnick protective hood respirator has a cup 40 that would be placed over the nose and mouth of a person. This cup 40, however, does not include a facepiece insert as that term has been defined by applicants. Resnick's protective hood respirator includes a cup 40 that appears to be made solely from a compliant face contacting member and lacks any apparent facepiece insert. Because Resnick does not disclose a facepiece insert in its cup 40, it is not possible for it to disclose "an apparatus that does provide a fluid communication component that is separately from the supporting portion of the facepiece insert" as recited in the Office Action.

Only applicants' invention describes a method of making a rigid insert, where the fluid communication component(s) is provided separately from the supporting portion of the insert. Further, only applicants' invention recognizes the benefits that are entailed when the fluid communication component is so provided. As indicated above, when the supporting portion and fluid communication components are made separately, the higher tolerance components can be manufactured in a location where persons are present who have the resources and training to correctly manufacture these parts. Applicants' invention therefore allows less room for error in manufacturing the higher tolerance parts. Applicants' invention also is more versatile than prior manufacturing techniques in that a whole new mold does not need to be provided when a different filter mount is decided to be employed. If a different filter cartridge is desired to be used on the same facepiece, the manufacturer does not have to fashion a whole new mold for the article.

In the Amendment mailed April 27, 2005, and in an Amendment mailed July 15, 2004, applicants provided amended definitions for the terms "compliant faced contacting member", "face piece insert", and "mask body". Those terms are reproduced below for ease of reference:

"compliant face contacting member" means the portion of a mask body that engages the facepiece insert directly or otherwise and is compliantly fashioned for making contact with a person's face to allow the mask body to be comfortably supported over a person's nose and mouth.

"facepiece insert" means a rigid element(s) that is fashioned to form part of the mask body but is made separate from the compliant face contacting member to provide structural integrity to the mask body to allow filtration elements and/or valves to be adequately secured thereto.

"fluid communication component" means an element that is structured to allow a fluid to pass from an interior gas space to an exterior gas space or vice versa.

"mask body" means a structure that can fit over the nose and mouth of a person and that can help define an interior gas space separated from an exterior gas space.

As indicated above, the references to Gleason and Resnick do not teach or suggest the present invention because they do not teach or suggest a face piece insert that has separate fluid communication components. In Gleason, the fluid communication components 42, 44 are integral parts of the face piece insert 26. In Resnick, the respirator has a mask body 40 that does not comprise a face piece insert. In Resnick, the fluid communication component 200 is illustrated as being a part separate from the mask body 40. Thus, neither Gleason nor Resnick teach or suggest providing a fluid communication component separately from the supporting portion of a face piece insert. Further, only applicants' invention recognizes the benefits that are entailed when the fluid communication component is provided separately from the supporting portion of the insert. When these parts are made separately, the higher tolerance components can be manufactured in a location where persons are present who have the resources and training to correctly manufacture these parts. The present invention therefore, allows less room for error in manufacturing the higher tolerance parts and is more versatile than known manufacturing techniques. Additionally, a whole new mold does not need to be used when a different filter

mount is used in the face piece insert. Therefore, if a different filter cartridge is desired to be used on this same face piece, the manufacturer does not have to fashion a whole new mold for the insert. The manufacturer only needs to make a new mold for the fluid communication component.

Because Gleason and Resnick fail to teach or suggest the basic elements of applicants' invention and also fail to recognize the benefits that are provided by the invention, these references, whether taken alone or in combination, would not have rendered applicants' invention obvious to a person of ordinary skill within the meaning of 35 USC § 103.

Respectfully submitted,

August 21, 2006

Date

By: 

Karl G. Hanson, Reg. No.: 32,900

Telephone No.: 651-736-7776

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833